REPUBLIC OF BULGARIA
THIRD NATIONAL REPORT (2010-2013)

ON IMPLEMENTATION OF THE CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES AND THE GUIDANCE ON TNE IMPORT AND EXPORT OF RADIOACTIVE SOURCES

INTRODUCTION

The IAEA plays a global role and pays special attention to the issues and problems relating to ensuring the safety and security of radioactive sources worldwide. The IAEA undertakes an active policy in this field and in cooperation with other international organisations and competent national authorities carries out complex measures for guaranteeing the safety and security of radioactive sources worldwide. The culmination of the IAEA's activities and efforts in this field within the last decade is the **Code of Conduct on the Safety and Security of Radioactive Sources** and its associated **Guidance on the Import and Export of Radioactive Source**s. The Code of Conduct and its associated Guidance are fundamental and guiding documents for IAEA Member States to ensure the safety and security of radioactive sources used for peaceful purposes , implementing and harmonising policies and strategies in this area. Most of the countries in the world, including all EU Member States, have officially endorsed the Code of Conduct and the Guidance and have undertaken the commitment to the IAEA to implement the relevant requirements for ensuring the safety and security of radioactive sources. The compliance with the Code of Conduct and the Guidance significantly contributes to not discredit the use of nuclear technologies and radioactive sources for the human needs.

In 2005 the Nuclear Regulatory Agency (NRA) as a State Regulatory Body responsible for safe use of nuclear energy and sources of ionising radiation in Republic of Bulgaria has notified the IAEA of the acceptance of the obligations to implement the Code of Conduct. The NRA expressed a written commitment to the IAEA to implement the Supplementary Guidance on the Import and Export of Radioactive Sources as well as state's respons to the Self-Assessment Questionnaire set out in Annex I of the Guidance. Republic of Bulgaria was included in the IAEA published list of States that have made commitments related to the implementation of the Code of Conduct and the Guidance.

In 2007 and 2010 during the international conferences organized by the IAEA the NRA presented National reports on the implemantation of the Code of Conduct and the Guidance. These two reports and the current third National Report present the status and the development of the National Regulatory Infrastructure (legislative framework, regulatory body, regulatory system, resources) to achieve the following objectives:

- to maintain a high level of safety and security of radioactive sources in order to ensure that the radioactive sources are safely managed and securely protected during their useful lives and at the end of their useful lives;
- to prevent unauthorized access or damage to, and loss, theft or unauthorized transfer of, radioactive sources, so as to reduce the likelihood of accidental harmful exposure to such sources or the malicious use of such sources to cause harm to individuals, society or the environment;
- to mitigate or minimize the radiological consequences of any accident or malicious act involving a radioactive source;
- to promote safety culture and security culture with respect to radioactive sources.

These objectives laid down in the Code of Conduct should be achieved through the establishment of an adequate system of regulatory control of radioactive sources, applicable from the stage of initial production to their final disposal, and a system for the restoration of such control if it has been lost.

Acording to the Act on the Safe Use of Nuclear Energy (ASUNE) the NRA is the Bulgarian state regulatory body responsible for safety and security of radioactive sources. The National Regulatory Infrastructure is established in order to ensure radiation protection, including safety and security of radioactive sources used and stored in the country. The National Regulatory Infrastructure is based on the principles and requiremenets laid down in the ASUNE, European legislation, Code of Conduct and other IAEA documents related to radiation protection, safety and security of radioactive sources.

Council Directive 2003/122/Euratom on the control of high-activity sealed radioactive sources and orphan sources is an EU regulatory act whose purpose is to prevent unnecessary exposure of workers and the public to radiation arising from inadequate control of so-called "high-activity sources". This EU Directive defines specific requirements for radiation protection and control over radioactive sources for which any loss of control poses a significant danger to people and unifies the requirements adopted by EU Member States for the safe management, control and security of the danger sources. The IAEA Code of Conduct and the Council Directive 2003/122/Euratom have common ground and may be considered in parallel when it comes to safe management and control of radioactive sources with high activity, when appropriate.

All areas of the NRA's competence are covered by regulations and a few regulatory guides. The need for each regulation is explicitly defined by ASUNE. These regulations and guides reflect the IAEA safety standards and other relevant international requirements. The procedures to develop, amend and revise regulations and regulatory guides are stringent. Well-defined review periods trigger regular updates which are keeping regulations and guides up to date. A comprehensive renewal programme for all regulations is presently undertaken and already in an advanced stage.

The legislative framework and the system for regulatory control related to safety and security of radioactive sources were presented in details in the previous two National Reports on the implementation of the Code of Conduct (2007, 2010) as well as in the National Report under Council Directive 2003/122/Euratom (2010) and the National Report on the radiation protection status in the Republic of Bulgaria during the period 2007-2012.

Many measures have been taken to upgrade the national infrastructure and to ensure that radioactive sources in the country are safely managed, properly stored and securely protected during their useful lives and safely disposed in compliance with the conditions of an authorization and related safety requirements. These measures are summarized in the third National report on the implementation of the Code of Conduct and the Guidance (2010-2013). The NRA implements such measures as, inter alia, the promulgation and publication of regulations and guides, the establishment of a scheme for the submission to the Regulatory Body of applications for authorizations, the inspection of operations with radioactive sources and the enforcement of compliance with the regulations.

CHAPTER 1
LEGISLATIVE FRAMEWORK

Action Plan for the implementation of EU legislation in the field of radiation protection was implemented, including legislative and administrative measures to upgrade the regulatory infrastructure and to enhance the safety and security of radioactive sources in the country. In 2010 the Bulgarian Parlament adopted the Act on amendment and supplement of the Act on Safe Use of Nuclear Energy (ASUNE, SG, No.80 of 12.10.2010). The new ASUNE was elaborated in accordance with the NRA policy for updating the normative requirements in conformity with the development of the international standards. The ASUNE covers the activities associated with the

state regulation of the safe use of sources of ionising radiation and with the safety and secutity of radioactive sources. In 2011 amendments and additions of the Regulation on emergency planning and emergency preparedness in case of nuclear or radiological accident was published. By Decree No. 229/25.09.2012 of the Council of Ministers a new Regulation on the basic norms for radiation protection was published as well as amendments of the Regulation on radiation protection during activities with sources of ionising radiation and Regulation on procedure for granting of licenses and permits for safe use of nuclear energy were made. The new Regulation on basic norms for radiation protection is based on the ASUNE, ICRP Publication No. 103, IAEA Publication "GSR Part 3" and Project "European basic safety standards" published by the European Commission in 2012.

The ASUNE and the regulations related to its implementation establish the regulatory framework in accordance with IAEA and ICRP recommendations and European legislation. The basic principals for radiation protection, safety and security of radioactive sources and the graded approach in the application of regulatory acitivities (authorization, inspection, enforcement) are included appropriatly in the ASUNE and relevant regulations. Maximal term of validity of granted licenses for activities with sources of ionising radiation has been prolonged to 10 years.
Also the concept for exemption and clearance was upgraded taking into account the new IAEA Publication № GSR Part 3 (Interim, 2011). In this regulation are determined the risk assessment criteria and the exemption and clearance levels.
The system for categorization of radioactive sources based on the "dangerous source" concept and IAEA documents "Safety Guide RS-G-1.9 -Categorization of Radioactive Sources", TECDOC-1344 and "Dangerous Quantities of Radioactive Material (D-Values)" has been implemented by the ASUNE, Regulation on radiation protection during activities with ionizing radiation sources and Regulation on emergency planning and emergency preparedness in case of nuclear or radiological accident.
A new definition of "high activity source" and respective activities for various radionuclides above which sealed sources are classified as high-activity sources are given in the Regulation on radiation protection during activities with sources of ionising radiation. Radioactive sources category 1, 2 and 3 are "dangerous sources" and fall into the "high activity sources" group under the Council Directive 2003/122/Euratom.
Specific requirements for licensees and permit holders have been introduced in the legislation for safe management and control of high activity sources, including record-keeping, inventory control, leak testing, identification and marking, control of the transfers and physical protection of the radioactive sources, taking into account the Code of Conduct and Counsil Directive 2003/122/Euroatom.
The typical form and content of an instruction on radiation protection and an emergency plan in facilities with radioactive sources are given in the Regulation on radiation protection during activities with ionizing radiation sources. Specific requirements for facilities with radioactive sources and for storages are introduced in this regulation as well as a requirement to licensees and permit holders to provide technical maintenance of systems and equipment for radiation protection.
The regulatory regime for import of radiation sources was modified in the following way:

- import of sealed sources of categories 1, 2 or 3 whose half-life period is greater than five years can be made only under condition that there is provided for return to respective manufacturers after cancellation of use;
- recipients of sealed sources shall send in advance to the manufacturer (supplier) declaration following the form in accordance with Annex I to Regulation No. 1493/93/ (EURATOM).
- when import/export of sources of ionising radiation to/from the Republic of Bulgaria is to be effected respectively from/to a country which is a member of the European Union, no permit for import of radioactive sources is required;

- when import/export of sources of ionising radiation to/from the Republic of Bulgaria is to be effected respectively from/to a country which is not member of the European Union, a permit is required.

The requirements for physical protection are imposed on equal terms with requirements for nuclear safety and radiation protection and are defined in the relevant regulation. The holders of licenses are obliged to ensure the physical protection in facilities with radioactive sources.
Guidance for control of scrap metal and response to incidents with radioactive scrap was published, developed according to the European Union Resolution № 2002/C119/05 and IAEA recommendations in this area.
According to the Regulation on the terms and procedures for acquiring professional qualifications and the procedures for issuing licences for specialised training and certificates of competence to use nuclear energy, the job positions of the personnel in facilities with radioactive sources are classified into five qualification levels (highest level 5 – radiation protection experts). Individuals who perform functions specified in job descriptions for specific positions must have the necessary professional qualification. A system for specialised training (initial and refreshing) is applied.

CHAPTER 2
REGULATORY AUTHORITY AND MEASURES IMPLEMENTED TO ENSURE THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES

Pursuant to the ASUNE, the NRA Chairman is an independent specialized authority of the executive power, delegated with the state regulation of all activities and facilities using ionizing radiation or causing radiation risk. The NRA structure, work organization and activities are stipulated in the rules, proposed by the NRA Chairman and adopted by the Council of Ministers.

The main mission of the NRA is the protection of individuals, the society, future generations and the environment from the harmful impact of ionizing radiation. The NRA priorities are set forth in its "Policy Statement". The activities are oriented mainly towards the elaboration of the standard requirements for nuclear safety, radiation protection, emergency planning and preparedness and physical protection, and the regulatory control of their strict observance. This includes both the process of issuance of licenses and permits and the on-site control and independent analysis of the documentation being submitted within the licensing process and periodically.
The NRA implements a graded approach and ensures and controls that:

- arrangements are made for the safe management and secure protection of radioactive sources, including financial provisions where appropriate, once they have become disused;
- inventory controls are conducted on a regular basis by authorized persons;
- are marked by users with appropriate signs to warn workers or members of the public, as applicable, of the radiation hazard;
- the areas where radioactive sources are managed and radioactive sources and their containers are marked by users with an appropriate signs to warn of the radiation hazard;
- radioactive sources are identifiable and traceable or alternative processes for identifying and tracing those sources are in place;
- the authorized persons have emergency plans prepared as appropriate;
- the regulatory principles and criteria remain adequate and valid taking into account operating experience and internationally endorsed standards and recommendations.

A licensing regime under ASUNE is introduced for all activities with radioactive sources used and stored in the country. Guidelines for the effective implementation of this regime are published. The NRA establishes procedures for dealing with applications for authorization which

publishes as appropriate and maintains records of persons with authorizations in respect of radioactive sources as well as records of the transfer and disposal of the radioactive sources.
According to the ASUNE the prime responsibility for the safe management and security of radioactive sources is placed on the persons being granted the relevant authorizations. Any person or organisation that manufactures, processes, stores or uses radioactive sources, is obligated to make inventory and keep records of the sources and to provide periodic information on the records to the NRA Chairman. Anyone who loses or finds any source of ionising radiation is obligated immediately to notify the NRA Chairman. The NRA requires prompt reporting by authorized persons of loss of control over, and of incidents with radioactive sources and promotes the establishment of a safety and security culture among all individuals and in all bodies involved in the management of radioactive sources.
The NRA Chairman has the authority to issue, amend, renew, suspend and revoke licences and permits. Internal rules and processes followed for issuing authorization are described in procedures and instructions issued under the management system of the NRA. During the authorization process, the NRA inspectors overseeing the proposals for issuing/renewing licences or permits perform a review of the documents submitted by the applicants. A graded approach to review and assessment of a facility or an activity with radioactive sources is applied by the NRA personnel. Inspectors might also conduct inspections should they decide these are necessary to support the review and assessment process.
In general the legal and regulatory framework for the authorization process and the authorization stages established are in line with the IAEA safety standards.
The NRA prepares provisions to recover and restore appropriate control over orphan sources and to deal with radiological emergencies and establishes response plans and measures in respect of orphan sources and assists in obtaining technical information relating to their safe and secure management.
The NRA organises campaigns for administrative and physical search of orphan sources in order to establish regulatory control, to secure them and to send the orphan sources for safe storage. A special procedure has been developed for actions in case of discovering of orphan sources. There is a special program to collect radioactive sources from past practices.
The NRA carries out planned and unplanned, announced and unannounced inspections at an appropriate frequency taking into account the risks presented by the radioactive sources and takes enforcement actions, as appropriate, to ensure compliance with regulatory requirements. The NRA inspectors verify the presence and the condition of registered sources in controlled facilities during inspections.
The possible enforcement actions are described in the ASUNE and can be: presciptions that are mandatory to the licensee; administrative penalty provisions with different fines depending on the violation; administrative enforcement measures (suspesion of a license or permit, suspension or limitation of certain activities). There are also provisions regarding violations of the safety regime for radioactive sources, including punisment in cases of unathorized transfer or illicit traffiking of radioative sources. The NRA uses a graded approach to enforcement, with clear delegation and assignment of responsibilities for the inspectors, and for the application of administrative enforcement and administrative penalties.
The NRA maintained a database for control and traceability of radioactive sources since 1992 whereas data from 2004 are maintained similar to IAEA “RAIS”. The National Register of sources of ionizing radiation (NRSIR) is electronic database maintained in accordance with Article 11 of the Code of IAEA and Article 5 of Directive 122/2003/Euroatom. The database automatically calculates the source category based on its activity. The NRSIR includes information about all sealed sources (category 1 – 5), devices (model, manufacturer, serial No, etc.), licensees, issued licenses and license conditions.
There is a system for notification in case of emergency events is established. Procedures for responding to emergencies with orphan sources or illegal trafficking are established and applied.

Infrastructure for emergency preparedness and response is created at national, regional and local level. Since 1998 the NRA maintains database for emergency events with radioactive sources, submits relevant reports and publishes information regarding such cases on its web page.
The physical protection of facilities with sources category 1, 2 and 3 has been strengthened and the safe storage of high-activity sources is provided.
A system for radiation control at border checkpoints and response in case of emergency events has been created. Technical equipment for radiation monitoring of cargo passing through the checkpoint have been delivered.

A Strategy for safe management of RAW (disused sources and others) based on the ASUNE was adopted by the Council of Ministers. The national infrastructure for safe RAW management and systems for accounting, control, classification and clearance of RAW are established in accordance with the IAEA recommendations and EU legislation in this area.

State Enterprise "Radioactive Waste" (SERAW) was established and licensed to operate the facilities for RAW management. Special fund "RAW" based on the AUUNE was assured for long-term financing of activities with RAW.
SE RAW implements special program (co-ordinated with the NRA) for the acceptance of RAW from past practices, including disused sources, orphan sources and other sources used in the country, transferred to SERAW in accordance with the Ordinance on the conditions and procedure for transfer of RAW. In Novi Han repository all disused sources, declared as RAW are collected for long-term storage. Projects for reconstruction and modernization of the Novi Han repository were completed.
The decision of the Council of Ministers and plan adopted to build a new National repository for low and intermediate level RAW are is in process of implementation (sites for the construction of this repository were studied).
According to the ASUNE licensees and permit holders are obliged to hand over to SERAW their disused sources after being declared as RAW. Decentralized temporary storage of disused sources takes place in appropriate facilities under conditions specified in the licenses and permits issued by the NRA.
After expiration of source operating lifetime it is allowed to reuse it for other purposes if justified and the requirements and conditions for safety are met and after an authorization by the NRA have been obtained for use for certain activity. In the country high activity sources dismantled from medical teletherapy units are used in industrial gamma irradiators. Reuse of radioactive sources is a reasonable alternative when justified and safe from radiation protection viewpoint.
The country does not produce radioactive sources and there is lack of appropriate equipment and technology for the recycling of spent sources. During recycling leak tests, reconstruction and re-seal and re-certification of sources is needed in factory conditions. Sending sources for recycling in other countries where this could happen appears practically impossible due to legal, economic and technical issues.
Return of disused sources to the manufacturer is possible if prior agreement exists. (In 2007 the disused sources of industrial gamma irradiator were returned to the manufacturer "Nordion"-Canada under contract signed in 1990.)
After the end of their life cycle and transfer to SERAW sources become state property. The activities of SERAW related to management of disused sources are under the NRA control.

FACILITIES AND ACTIVITIES AUTHORIZED BY THE NRA

All activities involving the use of sources of ionizing radiation (SIR) are subject to permit issuance procedure performed by the NRA in compliance with ASUNE. By decree No. 229/25.09.2012 of the Council of Ministers amendments were made to the Regulation on the Procedure for Issuing Licenses and Permits for the Safe Use of Nuclear Energy. A graded approach was introduced in respect of the permit issuing procedure depending on the radiation

risk during the performance of activities with SIR. The criteria for assessment of activities with insignificant radiation risk are defined in the new Regulation on basic norms of radiation protection. Where it is proven that the radiation risk during the performance of activity with SIR is negligibly low or insignificant, no license or permit for such activity is required. Justification is required only for new activities, for which it is not proven that the use of the activity is greater than the possible health damage.

The requirements to the licensees and permit holders related to ensuring the radiation protection, safety and security of radioactive sources, are determined in the ASUNE, the Regulation on Basic norms of Radiation Protection and the Regulation for Radiation Protection during activities with sources of ionizing radiation. The NRA keeps a public register of the licenses and permits issued.

In 2012, a total number of 287 licenses (new and renewed) were issued, out of which:

– for use of SIR – 267, including 230 for medical purposes, 3 for scientific purposes, 34 for industrial purposes.

– for transport – 7;

– for work with SIR for the purpose of technical servicing, installation, dismantling – 13.

Pursuant to Article 21 of ASUNE, 117 effective licenses are amended, and by request of the licensees, 93 licenses are terminated.

In 2012, a total number of 207 permits for activities with SIR were issued, as follows:

– temporary storage of radioactive substances – 24;

– construction, installation and preliminary tests – 175;

– single-time transportation of radioactive substances – 7;

– decommissioning of a site containing radioactive substances – 1;

– for import – 32;

– for export – 3.

The permits issued by the NRA for each import or export of SIR are accompanied by certificates, required by the Regulation on the conditions and procedure for recording and permitting foreign trade deals. In 2012, a total number of 42 certificates for import or export were certified. The main part of the imported SIR is intended for medical purposes (337 technetium generators - 3.8 TBq total activity, 223 packages ^{18}F - 3 TBq and other radiopharmaceuticals for nuclear medicine). High-activity sealed sources are imported for industrial gamma radiography (5 pcs. of ^{192}Ir and 5 pcs. of ^{75}Se). 61 declarations for supply of sealed SIR are certified in accordance with Regulation 1493/93 EURATOM.

Up to 31.12.2012, the total number of licensees registered at the NRA is 1243, and the permit holders for activities with SIR are 370. The total number of sites with SIR registered and controlled by NRA is 1585 (excluding sites with smoke detectors), distributed per area of application, as follows:

- for industrial purposes – a total number of 187 sites (70 sites – gamma radiography, 64 sites with technological control devices, 3 sites with static eliminators, 46 other sites –laboratories, X-ray structural and X-ray fluorescent analysis);
- for medical purposes – 1172 sites;
- for scientific purposes (research, education, agriculture) – 110 sites;

- for control purposes and other applications – 116 sites.

In 2012, the total number of registered and controlled sites with smoke detectors (SD) is 30. The NRA, jointly with the Ministry of Interior (MI) and State Agency "National Security" (SANS) continues the work on identifying the location of any unknown or orphan SD, their delivery to SE RAW, and the searching of any current and former owners of SD.

ACCOUNTING AND CONTROL OF RADIOACTIVE SOURCES

Pursuant to the ASUNE, the holders of licenses and permits, who produce, process, use or store SIR, are obliged to:

– perform inventory and keep records of the SIR they are in charge of and shall periodically present information to the Chairman of NRA about the results;
– appoint qualified persons responsible for SIR internal control;
– inform the Chairman of NRA immediately when absence or theft of SIR is found, as well as any other incident with SIR.

The conditions and order of radioactive substances accounting (sealed and unsealed sources) and other SIR are established in the Regulation for Radiation Protection during Activities with Sources of Ionizing Radiation. In the facilities with radioactive sources, an inventory is performed annually and the availability, location and condition of the used and stored sources is checked, as the manager of each site submits to the NRA a protocol of the inspection findings, drawn-up by the inventory commission assigned. Persons responsible for radiation protection are appointed and income and expense books, accounting the movement of the radioactive sources.

Up to 31.12.2012, the NRSIR includes a total number of 3664 sealed radioactive sources of categories 1 to 5, used in gamma irradiators, non-destructive testing devices, industrial devices or for other purposes (without SD).

Category 1 includes high-activity sealed sources installed in gamma irradiators. A total number of 19 gamma irradiators are used in the country: 10 for medical purposes (9 for gamma therapy and 1 for blood products) and 9 for industrial and research purposes. The total number of sealed sources loaded in them is 322.

Category 2 includes high-activity sealed sources, used for non-destructive testing devices and brachytherapy. The total number of non-destructive testing devices is 224; out of which 101 are used and periodically reloaded with ^{192}Ir or ^{75}Se (the remaining 123 are locally stored in the manufacturer's Uranium containers). The licensees use 86 vehicles for transportation of non-destructive testing devices in the country.

Category 3 includes the high-activity sealed sources used in the process control equipment (PCE) – gauges. The total number of the recorded PCE is 434 (the number of the sources built therein is 489), used and stored in 77 sites.

Category 4 includes the static eliminators, used in furniture and textile industry. The total number is 72 (the number of the sources built therein is 1017). Only 1 site uses static eliminators (6 pcs) with permission from the NRA, and the remaining ones are in storage. To the category 4 belong also other sources used for metrology purposes and laboratory measurements.

Category 5 includes smoke detectors and sources with very low activity used for control purposes.

The NRA submits information to MI, MH, State Agency "National Security" for facilities with radioactive sources, including copies of licenses and permits issued by theNRA.

Measures are implemented for resuming the control over any orphan sources and for enhancement of safety in the management of high-activity sources, spent sources and "historical"

RAW. Any detected orphan sources are safeguarded, transported and delivered to SERAW for safe storage. The orphan sources which are subject of investigation procedure are delivered for temporary storage in a repository, organized for such purpose and for subsequent expert opinion at the Institute for Nuclear Research and Nuclear Energy.

The control and assurance of safety and security of high-activity sources (including orphan sources) is a priority task for the NRA and MI. Control and traceability is implemented during the "life" cycle by the chain: import→transport→delivery→commissioning→usage→declaring to be RAW (or for recycling and reusing)→resign in SERAW.

At border crossing points (BCP), radiation control is performed for vehicles and cargoes with the aim of preventing any illicit traffic of radioactive materials. At the main BCP automated stationary radiation monitoring systems are installed. 6 mobile accelerators for scanning of large cargoes are put into operation at BCP. General Directorate "Border Police" (MI) has additionally been supplied with 17 portal monitors and 4 mobile systems for radiation control.

In the metallurgical factories are placed units for incoming radiological control with an alarm system for admission of metal scrap for remelting. A preventive radiological control of metal scrap is also performed with portable radiometric tools by officers of factories working with scrap and by licensed firms.

In finding illegal traffic, illegal import, export or transport of radioactive materials, the NRA notifies IAEA and competent bodies of States concerned.

REGULATORY INSPECTIONS IN FACILITIES WITH RADIOACTIVE SOURCES

In compliance with ASUNE, the NRA inspectors perform preventive, permanent and follow-up control in facilities with radioactive sources, in accordance with the annual inspection plan approved by the NRA Chairman. The scope and frequency of inspections depend on the category of the relevant radioactive sources and radiation risk. Facilities with high-activity sources (categories 1 and 2) are included with priority. The inspections are carried out in accordance with the approved "Instruction for inspections in facilities with sources of ionizing radiation". During inspections the following should be verified:

- compliance with conditions of issued licenses and permits;
- compliance with requirements and rules for radiation protection, safety and security during operation with radioactive sources, established with normative acts and internal documents;
- actual condition of compartments and equipment in facilities, existence and use of technical devices for radiation monitoring and individual dosimetric supervision, insurance of physical protection and emergency preparedness;
- existence and maintenance of documentation related to radiation protection and emergency preparedness in facilities;
- qualification and authorisation of personnel;
- implementation of recommendations and prescriptions related to radiation protection, emergency preparedness and physical protection.

Inspections during the period 2007– 2012

Year	Planned inspections	Unplanned inspections	Acceptance commissions	Total number of inspections	Prescriptions	Acts for violations

2007	**76**	**69**	**35**	**180**	**14**	**3**
2008	**98**	**134**	**82**	**314**	**79**	**4**
2009	**90**	**13**	**80**	**183**	**28**	**0**
2010	**56**	**22**	**79**	**157**	**11**	**1**
2011	**56**	**27**	**47**	**130**	**13**	**5**
2012	**58**	**137**	**97**	**195**	**12**	**3**

All facilities with gamma irradiators (category 1) are inspected every year. Facilities with category 2 sources are inspected once in 2 years, for category 3 - once every 3 years.
The inspection methods used by the NRA consist of monitoring and walk-down of the facilities, review of procedures, records and documentation, discussions and interview with personnel, tests and measurements. Inspections are planned (periodic), reactive, and pre-authorization inspections for commissioning of new facilities. Depending on their scope inspections may be comprehensive, covering the entire range of issues related to the safe use of ionizing radiation, or thematic that cover only selected areas in the inspection process. The inspectors keep records in protocols of findings.
In the case of non-compliance, the NRA inspectors have the authority to issue written prescriptions or to apply administrative enforcement measures based on the ASUNE.
Individual dose monitoring and a medical surveillance for the personnel are performed according with the regulatory requirements. The total number of individuals being covered by the system for control and assessment of occupational exposure is about 10 000 in the country. The number of persons who are under medical surveillance is about 14 000.

The results from the occupational radiation exposure control show that the average annual individual effective dose is about 30 times lower than the dose limit 20 mSv for the personnel category A. About 98% of them received individual annual effective doses below 1mSv.

ENERGENSY RESPONSE AND EVENTS WITH RADIOACTIVE SOURCES

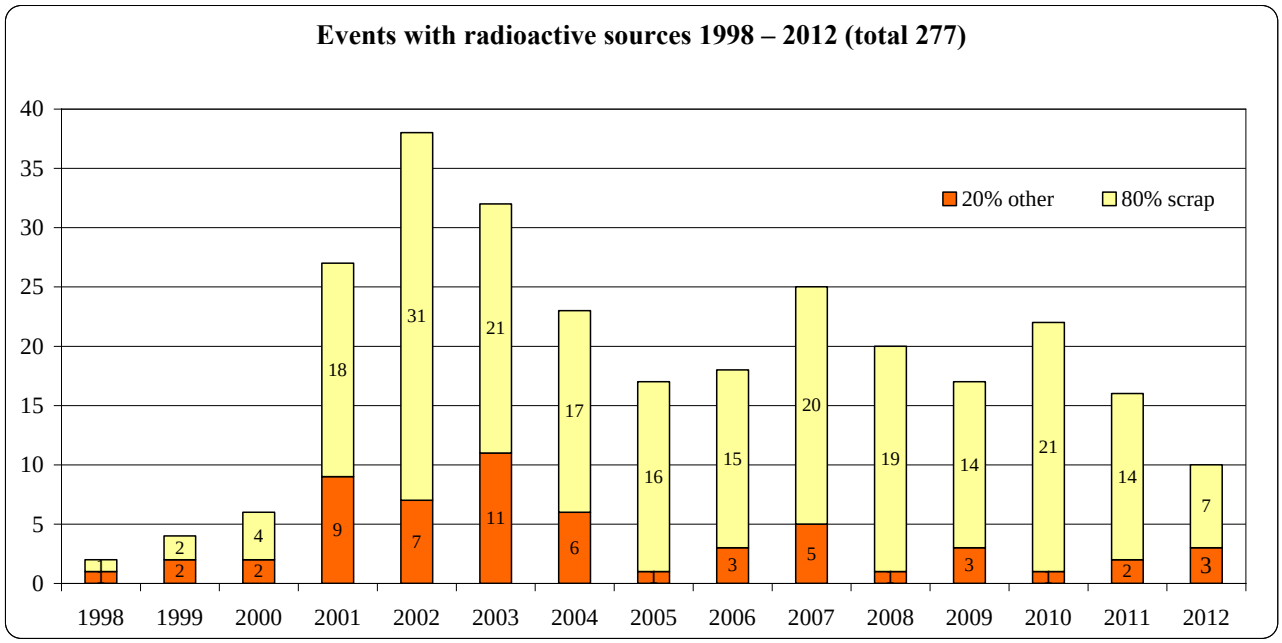
The NRA maintains a database of registered events with radioactive sources and regularly publishes information on its website. The analysis of the past 15-year period shows that about 80% of the events (220 in number) are related to radioactive metal scrap, most frequent of them (166 cases) are appliances or parts with luminous coating with radium-226 content. The remaining 20% of the events are related to orphan sources, theft of radioactive sources, illicit trafficking or other incidents with radioactive sources. There have been no radiological consequences for the population and the environment in any of the cases throughout the 15-year period being reviewed.
In 2012 two thefts of radioactive sources were registered:

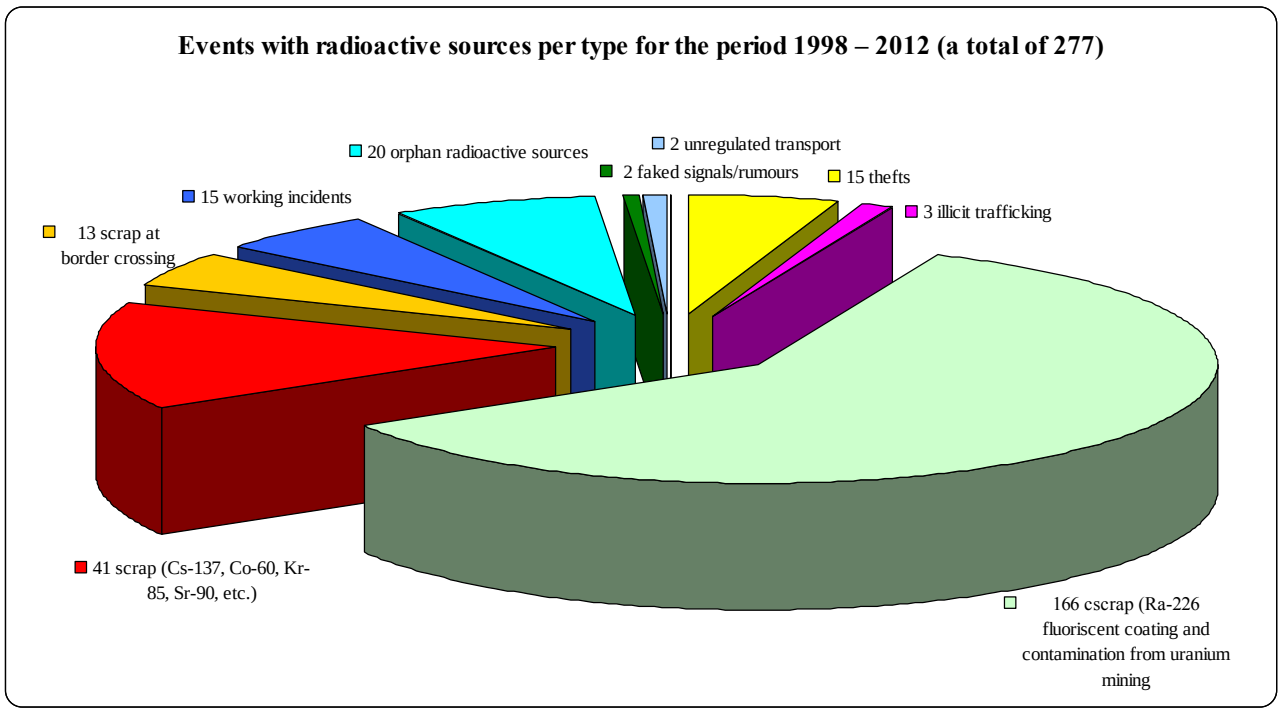
- Theft of non-destructive testing device "Gammamat R30", loaded with ^{192}Ir (0,38 TBq) ;

The MI and the NRA are notified about the incident and undertake immediately actions for finding the stolen device and notifying the public. Up to 24 hours the device is found and stored in a safe place. The event is evaluated as an incident "Level 1" by the NRA in accordance with INES scale.

- Theft of 3 containers (level gauges) with radioactive sources (^{137}Cs - activity 44 GBq each) from the chemical plant "Polimeri AD – Devnya"

The stolen sources are discovered and secured within less than 24 hours by the MI and the NRA. The event is evaluated as an incident "Level 2" by the NRA in accordance with INES scale.





On-site inspections were conducted by interdepartmental emergency teams, formed from employees of the NRA, MH, MI, SERAW, with respect to these events. The radioactive sources and materials found was isolated, transported and delivered for safe storage at the SERAW. There have been no radiological consequences for the population and the environment in any of the events throughout the period 1998-2012.

CONCLUSION

The system for regulatory control and the national infrastructure for safety and security of radioactive sources are established in compliance with the provisions and principles laid down in the Code of Conduct on the Safety and Security of Radioactive Sources and Council Directive 2003/122/Euratom. The Republic of Bulgaria trough the NRA fulfils its obligations under the IAEA Code of Conduct and Council Directive 2003/122/Euratom.

Fruitful cooperation is in place in the field of safety and security of radioactive sources, radiation protection, emergency planning and prevention of illegal traffic. With the aid of the European Union, IAEA and the USA, a number of improvements have been achieved regarding management and physical protection of high-activity sources and prevention of incidents with orphan sources and illegal traffic.

The strategy for enhancement the effectiveness of the regulatory control and for improvement the safe management of radioactive sources is based on IAEA recommendations and EU legislation in this field. There are measures planned to overcome of some problems and to upgrade the national infrastructure for safety and security of the radioactive sources.